

Claims

1. A method of storing a hierarchical document in a relational database comprising
 - 5 (a) parsing a hierarchical document,
 - (b) associating a unique identifier with respective parsed nodes of the document which includes information about the hierarchical position of the node in the document,
 - (c) storing the node with its identifier in a table of a relational database.
- 10 2. A method according to claim 1, wherein the identifiers are associated such that a predetermined ordering of the identifiers and associated nodes in the database produces a predetermined ordering of nodes.
- 15 3. A method according to claim 2, wherein the predetermined ordering of the nodes is that produced by a depth first traversal of a tree representation of the hierarchical document.
- 20 4. A method according to any preceding claim, wherein the identifier includes a separate character position for each hierarchical level in the document which is traversed to reach the associated node in the hierarchical document.
- 25 5. A method according to claim 4, wherein a unique prefix character is used each time the number of nodes in a particular hierarchical level exceeds the unique characters in the identifier alphabet.
- 30 6. A method according to any preceding claim, wherein at least one database table entry includes a document identifier which identifies the hierarchical document from which an node has been parsed.
7. A method according to any preceding claim wherein at least one database table entry includes a value field which records a value of the node in the table entry.

8. A method according to any preceding claim wherein at least one database table entry includes a type field which indicates a characteristic type of the node in the table entry from a predetermined set of types.
- 5 9. A method according to any preceding claim, wherein the hierarchical document is an XML document.
- 10 10. A method according to claim 9, wherein at least one database table entry includes a type field which indicates a characteristic type of the node in the table entry from a predetermined set of types and wherein the set of types includes text node, element node, attribute node and/or processing instruction.
- 15 11. A method according to claim 9 or claim 10, wherein the database table includes YPath and ZPath indexes pointing to predetermined respective entries in respective node and ZPath database tables.
- 20 12. A relational database comprising a table having an node field for storing an node of a hierarchical document, and an identifier field for storing an identifier associated with each respective node stored in the node field.
- 25 13. A database according to claim 12, wherein at least one database table entry includes a document identifier field for storing a document identifier which identifies the hierarchical document from which an node has been parsed.
- 30 14. A database according to claim 12 or claim 13, wherein at least one database table entry includes a value field for recording a value of an node in the respective table entry.
15. A database according to any of claims 12 to 14, wherein at least one database table entry includes a type field for storing an indication of a characteristic type of an node in the respective table entry from a predetermined set of types.

16. A database according to any of claims 12 to 15, wherein the database table includes node and ZPath indexes referencing respective entries in respective node and ZPath database tables in the database.
- 5 17. A database according to claim 16 wherein the YPath table includes fields for storing XPath element names and document IDs.
18. A database according to claim 16 or claim 17, wherein the ZPath table includes fields for storing XPath integer indexes and document IDs.
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19. A method of writing a hierarchical document comprising:- 3
- (a) reading data from a relational database which is representative of nodes of a hierarchical document,
- 15 (b) generating predetermined software events for respective read nodes, and
- (c) passing the software events to a content handler which is arranged to translate each software event into a written node of the hierarchical document.
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20. A computer readable medium carrying a program which when executed on a computer causes storing of a hierarchical document in a relational database by :- 4
- 25 (a) parsing a hierarchical document,
- (b) associating a unique identifier with respective parsed nodes of the document which includes information about the hierarchical position of the node in the document,
- (c) storing the node with its identifier in a table of a relational database.
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21. A computer readable medium carrying a program which when executed on a computer causes storing of a hierarchical document in a relational database by :- 5
- (a) receiving software events representing respective parsed nodes of a hierarchical document,
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- (b) associating a unique identifier with the respective parsed nodes of the document which includes information about the hierarchical position of the node in the document,
- (c) storing the node with its identifier in a table of a relational database.

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22. A computer readable medium carrying a program which when executed on a computer causing writing of a hierarchical document by :-

- (a) reading data from a relational database which is representative of nodes of a hierarchical document,
- (b) generating predetermined software events for respective read nodes, and
- (c) passing the software events to a content handler which is arranged to translate each software event into a written node of the hierarchical document.

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